inclined to look for a short cut to diagnosis of diseases of the chest and depend a little too much on mechanical measures. Too much emphasis cannot be placed on the necessity for a painstaking history, the observation of clinical symptoms, and a thorough physical examination. We should, however, remember that medicine is not an exact science and welcome every mechanical method and laboratory examination available and correlate them with the other findings before reaching a conclusion. Regarding the x-ray, as I have stated in a previous article, I think the roentgenologist should be considered as a consultant of the internist, and the chest condition be discussed with him just as we discuss cases with specialists in other branches of medicine and surgery rather than rely entirely on a stenographic report on the film.

❦

T. H. Toynbee Wight, M. D. (U. S. Veterans' Hospital, Palo Alto)—Doctor Williams' article is timely and full of good advice to the tired busy practitioner of medicine who is so often willing to turn over the responsibility of diagnosis to some laboratory. The colleges are turning out yearly thousands of sightseers who have looked over the field of bacteriology and serology and are searching for positions of trust. The practitioner must be on his guard against such diagnosticians while he must also encourage them in every way possible to gain that judgment without which opinion is of no value.

Doctor Williams labors under a slight misapprehension when he states that my stains were made up with tap water which contained acid-fast bacilli. He refers to a time when I warned the surgeons that acid-fast bacilli were numerous in our drinking water and that one must take this possibility into consideration when notice was given of the finding of two or three acid-fast bacilli in a specimen uncorroborated by clinical findings.

I have demonstrated the possibility of converting diphtheroids into acid-fast bacilli by means of lubricants, and wonder if we may not have to be on the lookout for malingerers when this possibility becomes more generally known. Since many of the coccoidal forms also take the stain under these conditions it will be but rarely that a competent technician need be confused by these appearances.

I think we should be grateful to Doctor Williams for the able manner in which he has presented his case.

❦

Doctor Williams (closing)—In reply to Doctor Dock, one cannot do otherwise than fully concur. I wonder, however, if it might not also be stated that the physician should strive to obtain as thorough training in laboratory work as in the non-laboratory methods, believing it would better enable him to interpret the laboratory findings and properly fit them in with the clinical findings.

In reply to Doctor Clark, we are in hearty accord, and I believe most roentgenologists seek just such a relation with the clinician as pictured.

I regret deeply the seeming misstatement I have made regarding the stains used in the laboratory at Hospital No. 24. I made the statement from memory of five years' duration, not from any written record. It shows again the importance of recording findings and not trusting to memory. Again, perhaps the misunderstanding will serve to lay emphasis on the importance of careful preparation of laboratory reagents even though in this particular instance Doctor Wight's laboratory had not been guilty. Doctor Wight clearly points out another source of possible contamination of sputum through drinking such water as referred to.

I am deeply grateful to the three doctors, whose opinions I value most highly, for discussing this paper.

RADIATION THERAPY IN HYPERTHYROIDISM*

By Albert Soiland, M. D.
William E. Costolow, M. D.
and
Orville N. Meland, M. D.
Los Angeles

Discussion *by Lyell Cary Kinney, M. D., San Diego; J. Marion Read, M. D., San Francisco; William Henry Gilbert, M. D., Los Angeles.*

THYROID disease and its surgical treatment has been ably discussed during the past twenty-five years. Previously the treatment of this condition had always been considered to be medical. Surgical technique has been greatly improved in recent years, and the surgical treatment of thyroid conditions is fairly safe and simple in competent hands. This is especially true in patients having non-toxic thyroid disease. In toxic goiter or hyperthyroidism the mortality rate is still appreciable and end results far from ideal. After reading many papers written upon the surgical treatment of hyperthyroidism, one might obtain the idea that this procedure was practically without danger and about 100 per cent curative. However, a careful review of the literature will reveal that the facts are otherwise. There are many patients who show recurrence of symptoms after operation, and other patients have apparently not received much benefit. Probably the actual surgical cures in selected cases of hyperthyroidism do not exceed 65 to 75 per cent of the patients treated.

The mortality from operations for hyperthyroidism in clinics like those of Crile and the Mayo's, after careful selection and grouping of cases, may be only a fraction of a per cent, but as shown by Crotti and others the mortality by the general surgeons throughout the country is probably nearer 12 to 15 per cent.

In the past ten years the consistent reports of cases made by radiologists throughout the world show that the results of radiation treatment of hyperthyroidism are certainly equal to those obtained by surgery. The logic of the radiation treatment is based upon the fact that in hyperthyroidism there is hypertrophy and hyperplasia of the thyroid cells, with an increased secretory function. Surgery cures by removing the greater part of the hyperactive gland. Radiation cures by destroying and shrinking a large number of the hyperactive cells.

SELECTION OF PATIENTS FOR RADIATION TREATMENT

We believe the most important factor in the success of radiation treatment is the proper selection of patients. All non-toxic goiters (cysts and adenomata) and all toxic adenomata should be removed surgically. If there is some contraindication to surgical removal of toxic adenomata, then radiation may be used—often with very good results. However, the operative risk is so small, and the surgical results so good in toxic adeno-

* Read before the Radiology Section, California Medical Association, at the Fifty-Sixth Annual Session, April 25-28, 1927.

mata, that this type should be referred to the surgeon.

In most substernal goiters surgery should be resorted to if it is possible to remove the mass and the patient's condition permits. Some of the toxic substernal masses are hyperplastic and may disappear after radiation.

We believe radiation should be given first consideration in the selection of treatment of the so-called exophthalmic goiters or cases of hyperthyroidism. The only cases of this group in which surgery is especially indicated are the ones where the gland is large enough to cause pressure symptoms. If radiation is confined only to cases of hyperthyroidism the results will be as good and probably better than surgery, as the treatment is gradual and can be better controlled, and there will not be a mortality rate.

In postoperative cases of hyperthyroidism, radiation is certainly indicated. Numbers of these patients are continually being seen by all radiologists, which is evidence of the fact that it is not always possible to remove just the proper amount of thyroid tissue to cure the toxic symptoms. The fact that with radiation treatment the thymus is also treated, may be one reason why these postoperative cases, which are still toxic, respond so well to radiation.

CONTRAINDICATIONS COMMONLY ADVANCED

In properly selected cases of hyperthyroidism there can be no logical contraindications to radiation treatment. One contraindication that is sometimes advanced is that the radiation treatment is slow and serious visceral changes may take place before beneficial effects from radiation are obtained. In the milder cases this is of no importance because serious visceral changes are slow in appearing and usually there is benefit from radiation before this could occur. In severe cases of hyperthyroidism the patients must be prepared medically anyway before surgery is done, and usually the operative procedure is in several stages, so the elapsed time is as great as it would be from the radiation treatment.

A few years ago some of the surgical textbooks showed horrible examples of x-ray burns on the neck and proclaimed this a serious contraindication to radiation therapy in thyroid disease. This, of course, is an unreasonable argument, because with present methods and technique even a skin reaction need not be produced. Only 25 to 30 per cent of an erythema dose is given at two or three-week intervals, and it is impossible to injure the skin except from carelessness or lack of skill on the part of the radiologist. Others have said that if the thyroid is once radiated an operation later is much more difficult. Many reports from prominent surgeons and pathologists have discredited this. The general agreement is that it is impossible for the surgeon or pathologist to pick out the cases which have had previous radiation. Difficult operation is often met with in cases where there has been previous thyroiditis with fibrosis, so some of the operative difficulties ascribed to radiation probably have no relation to previous radiation. However, if the cases are properly selected for radiation it is very seldom that surgery will ever be needed. At times it has been mentioned that hypothyroidism is liable to be produced. After treating over four hundred cases of hyperthyroidism by radiation (two hundred of these being reported in 1921) and also after raying many cases of malignancy of the glands of the neck, where the thyroid received very large doses of ray, we have never seen a case of myxedema develop. This coincides with the experience of many radiologists throughout the world. If during treatment the metabolism is watched and treatment discontinued while the metabolism is still somewhat increased, no fear of producing myxedema need ever be entertained.

VALUE OF METABOLISM TEST

The metabolism test is invaluable in radiation treatment of hyperthyroidism. Often after treatment is instituted there is a slight increase in the metabolic rate and both the patient and the physician may be discouraged. If, however, the treatment is continued it will be noticed that the patient is beginning to recover from the nervous symptoms, pulse is slower, muscular weakness disappears, and there is a gain in weight. At the end of three or four months the metabolic rate is lower or may even be normal. There is no need for discouragement even if at the end of two or three months there is still an increased metabolic rate, as some patients are six months in returning to normal. Many patients are persuaded to go to the surgeon after a few radiation treatments who could be entirely cured if the treatment were only continued.

TREATMENT

The severe cases of hyperthyroidism should be kept in bed and the patient kept under the observation of a competent internist, using the same routine that the skillful surgeons have used lately to lower the surgical mortality. Iodin in the form of Lugol's solution may be used before and during radiation treatment, in the same manner it is used by the surgeon in preparing the patient for operation. The radiologist should exercise the same painstaking care as the surgeon does in these serious cases, because radiation is a destructive procedure of the hyperactive cells and should be considered to be of the same major importance as is the surgical destruction of the hyperactive thyroid gland. Many of the milder cases may be able to continue light work while taking the radiation treatment, which is often a factor of great economic importance. The large number of patients who are seen with increased metabolic rates and moderate hyperthyroidism, and who may be treated so easily and effectively by radiation, without mortality, leads us to believe this method of treatment should always be given first consideration.

1407 South Hope Street.

DISCUSSION

LYELL CARY KINNEY, M. D. (1831 Fourth Street, San Diego)—Doctor Soiland's paper is a comprehensive and impartial statement. However the case is to be handled, the successful treatment requires teamwork. The radiation is given at long intervals and should be considered as only a part of the general care of the patient. At all times the patient should be under

the care of a competent internist who will direct the rest, diet, and medication while the radiological consultant sees the case at proper times to determine his therapy. This cooperation frequently results in success not otherwise obtainable.

The determining factor in therapy is the metabolic rate. This curve should be frequently checked at least before each radiation series. As Doctor Soiland states, a proper metabolic check is complete insurance against over atrophy of the gland. It is a reliable indication of the amount and frequency of the treatment required.

The value of radiation is beyond question in mild cases of hyperthyroidism in young people and in postoperative cases with persistent symptoms. In advanced cases with large fibrous thyroids and with definite visceral changes lobectomy offers a much higher percentage of cures and is more prompt and certain. Here radiation should be reserved for postoperative treatment or poor surgical risks.

The radiation therapy of hyperthyroidism in selected cases is safe and satisfactory in expert hands, but it requires the same clinical judgment and technical exactness as does the surgical management. The average minimum time required for radiation control of hyperthyroidism is not less than three to four months. The patient should understand these facts and the treatment be undertaken seriously and systematically for at least that period of time. Lightly to refer a patient for "a few x-ray exposures" is worse than useless.

❦

J. Marion Read, M. D. (870 Market Street, San Francisco)—I am very glad to have heard this paper of Soiland, Costolow, and Meland. The radiation therapy of hyperthyroidism has long interested me, but only as an internist anxious to employ any measure which is apt to help the patient, and is also free from danger. It is in this light that I view radiation therapy of hyperthyroidism and upon this basis that I employ it. I am not convinced that thyroidectomy is a rational procedure nor the best therapy in this condition. This does not refer to so-called toxic adenomata because the presence of multiple nodules is evidence of the gland's loss of ability to function normally, and its surgical removal then becomes advisable.

In a considerable series of cases of Graves' disease I have used radiation therapy, and in this journal (January, 1924), I reported fifty cases somewhat in detail. I wish I could be as certain as the authors of this paper that the roentgen ray "cures by destroying and shrinking a large number of the hyperactive cells." While still using radiation, empirically, in the non-surgical treatment of Graves' disease I do not regard it as curative, for it is directed only at the thyroid (and sometimes thymus) and the belief has forced itself upon me that this is not a disease primarily of the thyroid and that measures directed solely at this gland will prove unsatisfactory in most cases. As far as the thyroid participates in the pathologic physiology of Graves' disease iodin will effectually take care of its hyperplasia and vascularity.

I agree with the authors regarding the necessity of patience in the employment of radiation and would even extend the time of treatment to six months, and then not be surprised if the patient did not fully recover for three years. The too early discharge of thyroidectomized patients as "cured" accounts for the number of such patients seen by every internist. The patient with Graves' disease should be under medical supervision for three years regardless of the form of therapy employed.

There is one point upon which I wish to differ from the authors and that is the advisability of radiation therapy in thyroidectomized patients. I believe these patients who continue ill after operation should have other therapy than that directed to the thyroid gland. The only cases of myxedema I have seen after roentgen-ray therapy were in patients who had also had thyroidectomy. One may say it was the thyroidectomy alone which was responsible, since this unfortunate result no longer occurs with modern, well-controlled radiation therapy, but does follow after thyroidectomy in a certain number of cases.

❦

William Henry Gilbert, M. D. (520 West Seventh Street, Los Angeles)—As a general surgeon I have always taken a deep interest in treatment of the various forms of goiter. Unfortunately, like the treatment of cancer, it has been divided into medical, radiological, and surgical. We have reached a stage in the treatment of cancer where anything that will aid in the cure of the disease is adopted. In a measure this is true of the treatment of goiter. I have been particularly impressed by the results acquired with x-ray in the treatment of the exophthalmic type of Graves' disease. So pronounced has been the benefit at times that cases which were inoperable had been rendered safe risks by its use. I have seen the metabolism drop from thirty to sixty points in thirty days and in numerous instances the metabolism drop was accompanied by a decided reduction in the size of the gland. The question of how much to remove at the time of the operation is one that cannot be answered with any degree of accuracy. The surgeon depends upon his experience and judgment, and in the summing up of results the personal equation of the operator has to be taken into consideration. It is no uncommon thing for the metabolism rate to stay considerably over plus twenty after thyroid surgery. This incident I have noticed many times after operation by the most competent surgeons. Having my own metabolimeter and x-ray equipment I have been in a position to test many cases of postoperative hyperthyroidism. It is discouraging to a patient who has undergone a thyroidectomy to have within a year a gradual relapse of the old condition, and when one advises another operation it is difficult to convince him that the first operation was not a failure and that the second procedure is justified and necessary. Personally I am not in so great hurry to reoperate on these patients as formally because I have found that many of them make a complete and satisfactory recovery by the judicious therapeutic use of the x-ray. I am deeply interested in Doctor Soiland's paper and feel that every surgeon who investigates x-ray therapy in the treatment of thyrotoxicosis will find that it is a valuable assistant. This is especially true in the treatment of the exophthalmic type of the disease.

I know something of the work done by Doctor Soiland in Los Angeles and can testify to the truthfulness of his assertions and the excellence of his results. I have repeatedly operated on patients who have been x-rayed and I have no recollection of the difficulties reported as the result of x-ray therapy. I am satisfied that thyroiditis is more often the cause of surgical difficulties than radiation. It is hard for surgeons to keep an open mind when any remedy for toxic goiter other than some favorite surgical procedure is suggested. Personally I am for what is best for the individual patient, and I am satisfied that in the x-ray we have a valuable remedy, both in curing the disease and in preparing patients for operation.

❦

Doctor Costolow (closing)—I wish to express my appreciation for the constructive discussion of this paper.

I certainly agree with Doctor Read that the so-called disease of hyperthyroidism or exophthalmic goiter may not be a disease primarily of the thyroid gland and that measures directed solely at this gland may prove unsatisfactory. In radiation treatment the thymus is always included, and often in women, where the improvement is slow following radiation of the

thyroid and thymus, the ovaries are radiated. In a number of these patients we have seen a rapid decline in the metabolic rate, and improvement of symptoms follow almost immediately after mild radiation of the ovaries.

Just what the connection is between the chain of glands of internal secretion and the symptoms of hyperthyroidism is not definitely known, but it certainly seems to exist. If surgical destruction or removal of part of the thyroid is a logical procedure in the treatment of hyperthyroidism, certainly the x-ray destruction must be equally as logical, with the additional advantage that this agent may also be used to influence the thymus and possibly other glands of internal secretion.

We cannot agree with Doctor Read that it is inadvisable to radiate thyroidectomized patients. Our experience agrees with what Doctor Gilbert has just said, that many of these cases make a complete and satisfactory recovery if radiation is given. Other therapy may be used advantageously and will not interfere with the radiation treatment. As stated before, we have not seen myxedema following thyroid radiation.

It must be remembered that radiation treatment of hyperthyroidism is much newer than surgical treatment and sufficient time has not elapsed for the accumulation of statistics comparable with those of surgery, although a great deal of this work has been done all over the world in the past ten years. This method is not advised as the only method of treatment in hyperthyroidism, but, as has been shown, if used in properly selected cases it is equally as scientific and efficient as any method available at the present time and without mortality.

PULMONARY ABSCESS—POSTOPERATIVE*

By LEWIS FRANCIS MORRISON, M. D.
San Francisco

DISCUSSION *by Leo Eloesser, M. D., San Francisco; Emile Holman, M. D., San Francisco; Harold Brunn, M. D., San Francisco; William J. Kerr, M. D., San Francisco.*

THIS paper comprises a report on data available at the University of California and San Francisco County hospitals from 1913-1927.

During the fourteen-year period 241 patients with lung abscess have been cared for in the two hospitals; of these 241, there are 40 patients (20, University of California Hospital and 20, San Francisco County Hospital) with a definite history of onset of symptoms following sufficiently near to some operative procedure to lead one to believe that the abscess resulted from the operation or procedures intimately associated with the operation. The remaining 201 may be grouped as: (1) a small number of known etiology such as those of parasitic origin; (2) those with history of onset insufficient to justify the association of the abscesses with some operative procedure; and (3) those whose etiology is unknown except for the fact that they "caught cold," had a "bad cough" and "have been coughing up foul sputum ever since." This paper discusses the forty postoperative lung abscess case histories and offers but brief consideration of the remaining 201 cases.

INCIDENCE

It is unfortunate that complete data essential for the determination of the incidence of lung abscess as a complication of tonsil operation is difficult to obtain. In the available histories the facts associated with the original onset of the condition are too brief to be of much value for statistical consideration. A typical history often lacks such important details as: place of operation, date of operation, operator, anesthetic employed, immediate postoperative course, etc. The typical history of the patient with lung abscess following tonsillectomy reads somewhat as follows: "Some time ago the patient had a tonsillectomy. The immediate postoperative recovery was uneventful and the patient was discharged to his home on the following morning. Three days later the patient caught a 'cold' and it seemed to settle on his chest. On the following day something broke in his chest and he spit up a relatively large amount of foul-smelling sputum." And so it goes on to describe the subsequent events in the course of the condition. In all instances it was possible to ascertain from the hospital records that the majority of these patients had been operated on elsewhere, had gone through a gradual series of "ups and downs," both physical and financial, and during one of the "down" periods had applied for aid at either the University of California or San Francisco County hospitals.

The history of lung abscess subsequent to operations other than tonsillectomy is, in many respects, more complete. These other operative procedures necessitate hospitalization of the patient for a week or more, during which time the abscess had had time to manifest itself. It is also a fact that the pulmonary status of such postoperative patients is watched more carefully than is that of the tonsillectomized patient.

Twenty of the forty postoperative lung abscess patients here considered followed some operative procedure performed in one or the other of the two hospitals. Histories of the twenty following tonsillectomy show that only four had been operated on in either of the two institutions. This leaves sixteen posttonsillectomy patients to be distributed among the other hospitals of this and the relatively adjacent communities because the records also show that the average lung abscess patient does not wander very far.

The ratio of occurrence of pulmonary abscess following tonsillectomy falls well within that presented by other investigators, in that during the period from 1913-1927 there were approximately 19,000 tonsillectomies performed at the two hospitals with only four lung abscesses, or in other words one in 4800. If the records of the other nearby hospitals were available they would,

* From the Department of Otorhinolaryngology of the University of California Medical School.